INTRODUCTION TO FORCES

THE NATURE OF FORCES

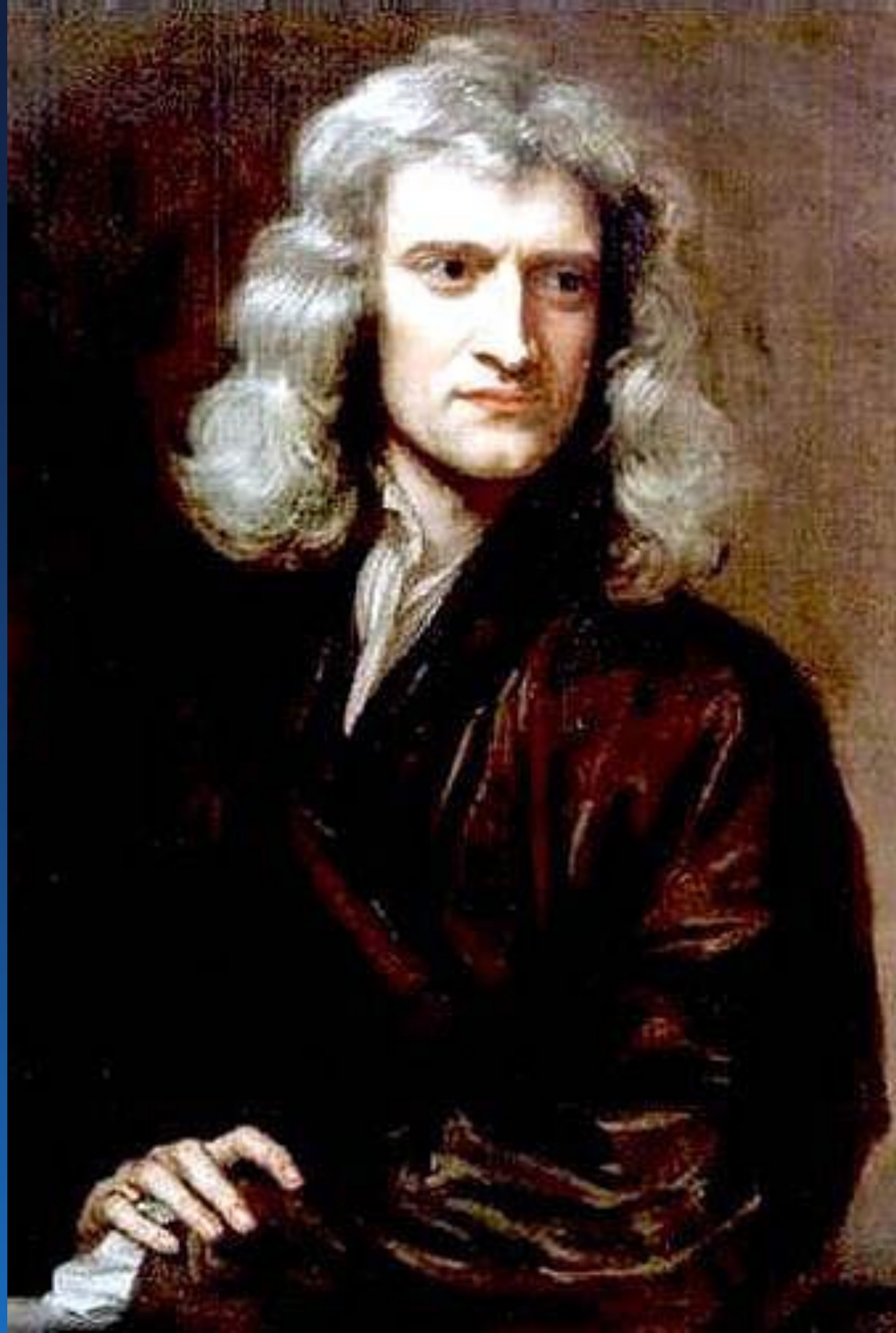
WHAT IS A FORCE?

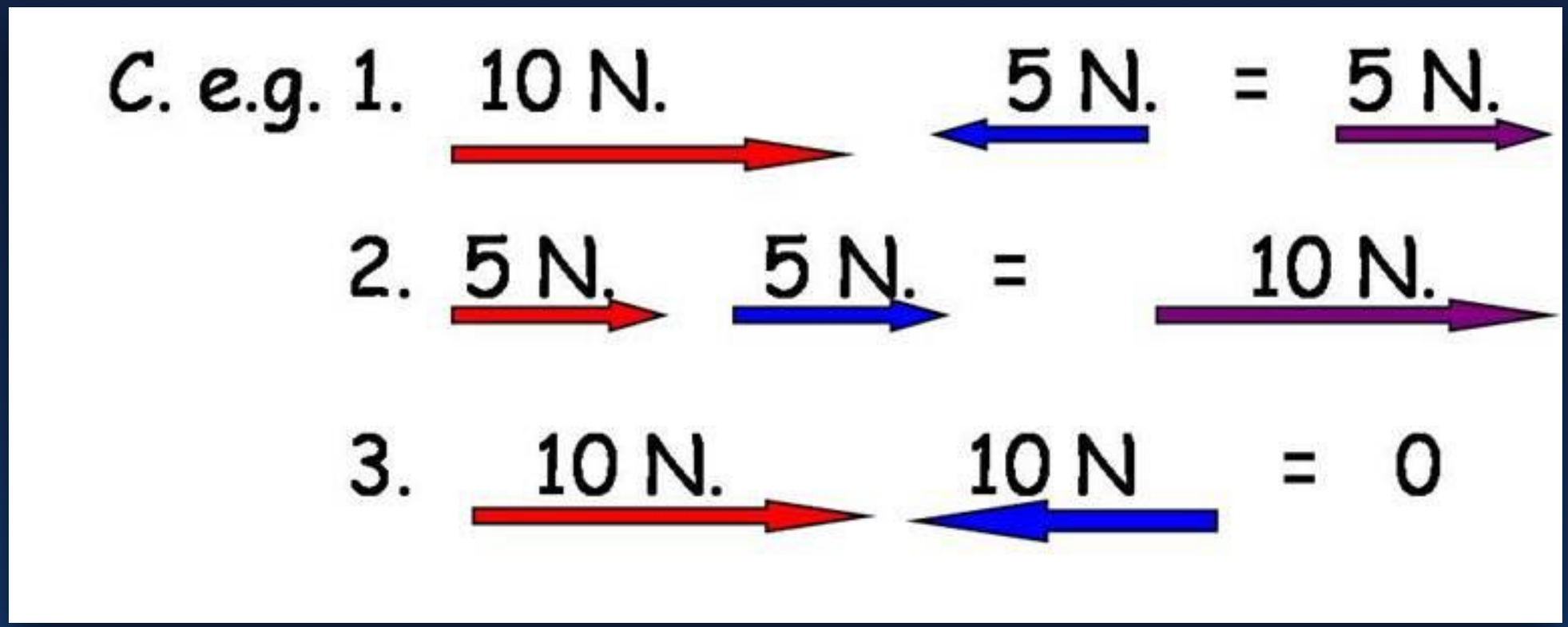
What causes an object to start moving, stop moving, or change direction? The answer is force.

A force is a push or a pull. When one object pushes or pulls on another object, you say that the first object exerts a force on the second object.

Forces are described not only by how strong they are, but also by the direction in which they act.

The strength of a force is measured using the SI unit the newton, named for Isaac Newton, an English mathematician.



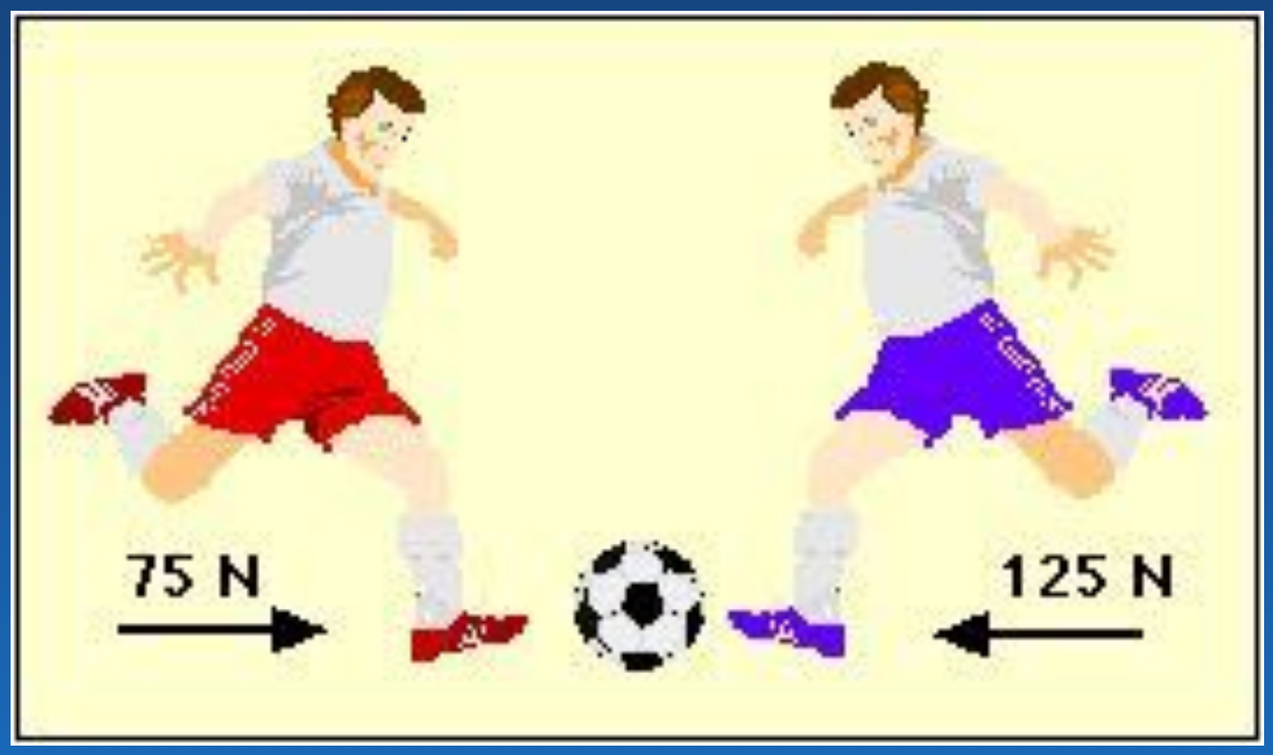


Picking up a small lemon requires you to exert a force of about one newton. Forces can be shown using arrows. The length of the arrow represents the size of the force, and the direction of the arrow shows the direction of the force.

COMBINING FORCES

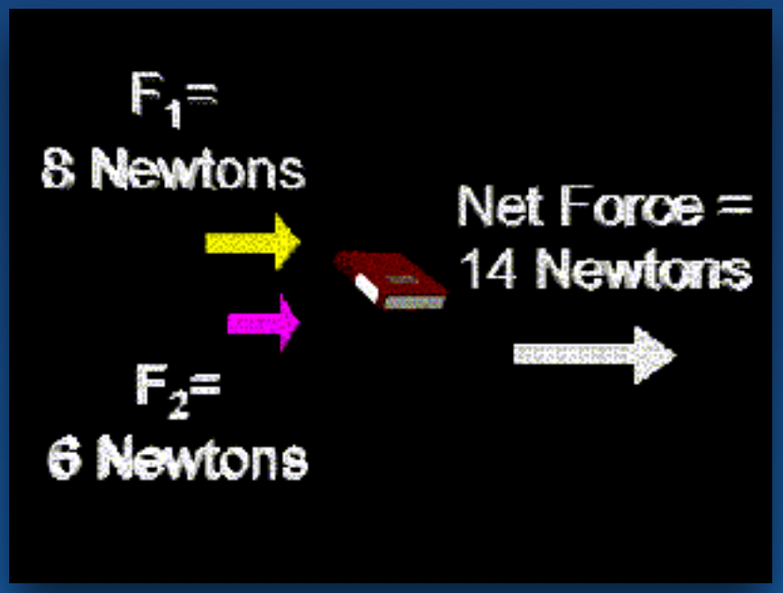
Often, more than a single force acts on an object at one time. The overall force on an object, called the net force, is found by combining all of the forces acting on the object.

The size of the net force determines whether the object's motion changes. The direction of the net force determines the direction of the object's motion.

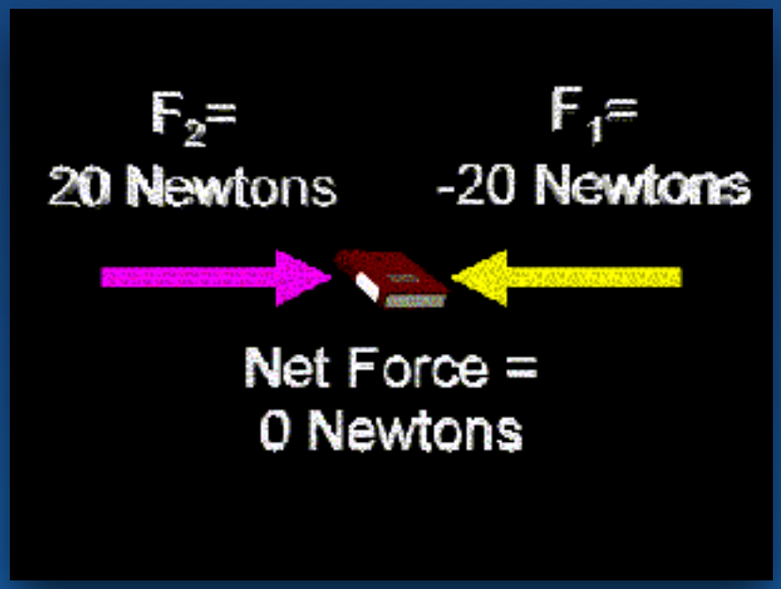


When two forces act in the same direction, the net force can be found by adding the strengths together. When forces acting in opposite directions, they are combined by subtracting the smaller force from the larger force. However, you must pay attention to the direction of each force.

Adding a force acting in one direction to a force acting in the opposite direction is the same as adding a positive number to a negative number. So when two forces act in opposite directions, they combine by subtraction.



The net force always acts in the direction of greater force. If the opposing forces are of equal strength, there is no net force. There is no change in the object's motion.



UNBALANCED FORCES

When there is a net force acting on an object, the forces are said to be unbalanced. Unbalanced forces can cause an object to start moving, stop moving, or change direction. Unbalanced forces acting on an object will change the object's motion.

BALANCED FORCES

Equal forces acting in opposite directions are called balanced forces. Balanced forces acting on an object will not change the object's motion. When you add equal forces in opposite direction, the net force will be zero.

KEYWORDS: ENGLISH - SPANISH

Forces - Efectivo

Net Force - Fuerza neta

Balanced Force - Fuerza equilibrada

Unbalanced Force - Desequilibrada fuerza